1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: **Sira 13ATEX1182X** Issue: **0**

4 Equipment: **Open Path Gas Detector**
SafEye Quasar 900

5 Applicant: **Spectrex Limited**

6 Address: 218 Little Falls Road
Cedar Grove
New Jersey 07009
USA

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 60079-0:2009	EN 60079-0:2012	EN 60079-1:2007
EN 60079-7:2007	EN 60079-11:2012	EN 60079-31:2008

The above list of documents may detail standards that do not appear on the UKAS Scope of Accreditation, but have been added through Sira's flexible scope of accreditation, which is available on request.

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

II 2(2)G D
Ex d e ib [ib Gb] IIB + H_2 T4 Gb
Ex tb IIIC T135°C Db
Ta = -55°C to +65°C

A C Smith
Certification Manager

Project Number 24892

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England
Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE **Sira 13ATEX1182X**
Issue 0

13 **DESCRIPTION OF EQUIPMENT**

The SafEye Quasar 900 Series Open Path Gas Detector, consists of four source units and one type of detector with electrical ratings as follows:

Type	Model No.	Voltage Supply Range	Peak Supply Current
Detector	QR-C-11X	18 - 32 Vdc	200 mA
Source 1	QT-C-11X	18 - 32 Vdc	220 mA
Source 2	QT-C-21X	18 - 32 Vdc	220 mA
Source 3	QT-C-31X	18 - 32 Vdc	220 mA
Source 4	QT-C-41X	18 - 32 Vdc	260 mA

The Quasar 900 Series includes four models each using the same detector with a different source to provide the ability to detect at distances of 7 - 200m.

The enclosure used for both the source and detector units of, is of cylindrical construction, made of stainless steel and has two separate chambers; one flameproof and one increased safety. The equipment is shown below in a typical mounting arrangement.

At one end of the flameproof chamber there is an end cap secured with four screws forming a spigot joint with the main enclosure. This end cap has a sapphire window in the centre which is secured from the inside with a retaining ring screwed to the enclosure; this window forms a flanged joint against the enclosure. Externally, there is a hood above the sapphire window and a permanent guard.

There is a spigot joint at the opposite end of the flameproof enclosure, formed by another end cap, with identical flamepath dimensions as those at the sapphire window end. The other side of this end cap forms part of the increased safety chamber. The two spigot joints are each secured by four M6 x 1.0 stainless steel socket head cap screws which have a minimum yield stress of 344 N/mm2.

The base of the increased safety enclosure protrudes from the flameproof enclosure end cap, has two ¾" NPT or M25 threaded entries on one side and a 3 5/8" parallel thread on the end, to which a threaded cover is attached. This threaded cover has a glass window secured from the inside by a threaded retaining ring.

The flameproof and increased safety chambers are separated by a partition with a cylindrical section filled with a non-metallic compound forming a bushing, through which there are cables for the connection of circuits between the two chambers.
Inside the flameproof chamber there are a range of PCBs, including some I.S. barriers. The outputs of these I.S. barriers are fed to an LED situated in the increased safety enclosure and on the detector units, to the I.S. port mounted on the side of the enclosure. There are also some component approved increased safety terminals inside the increased safety enclosure for connection to circuits in the flameproof enclosure and to external circuits.

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England

Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

The area behind the I.S. connector port is filled with non-metallic compound and forms a cemented joint. The outputs from the I.S. port are fed from the I.S. barriers and are therefore intrinsically safe.

All joints on which dust protection by enclosure depends are fitted with ethylene propylene O-rings.

The gas detectors meet level of protection IP6X and have been independently tested according to the requirements of EN 60529 to meet IPX6.

The interface board located in the equipment provides intrinsically safe outputs. The maximum voltage that can be applied to the interface board is Um=32V.

Intrinsically safe outputs have the following parameters:-

Parameter	Channel						
	LED 1	LED 2	HART CON	RS485 +	RS485 -	5V	All combined
Uo =	6.51V	6.51V	6.51V	6.51V	6.51V	6.51V	6.51V
Io =	68.5mA	68.5mA	68.5mA	68.5mA	68.5mA	263mA	605.5mA
Po =	111.5mW	111.5mW	111.5mW	111.5mW	111.5mW	428mW	0.986W
Ci =	0µF	0µF	0µF	0µF	0µF	0µF	0µF
Li =	0µH	0µH	0µH	0µH	0µH	0µH	0µH

These outputs connect to circuits external to the Ex d enclosure.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

Issue	Date	Report number	Comment
0	18 April 2013	R24892C/00	The release of prime certificate.

15 SPECIAL CONDITIONS FOR SAFE USE (denoted by X after the certificate number)

15.1 The dimensions of the flameproof joints are other than the relevant minimum or maximum values required by table 2 of EN 60079-1:2007 for IIB + H_2, as detailed below:

Flamepath Description	Type of joint	Minimum Width 'L' (mm)	Maximum Gap i_C (mm)
Cylindrical section of spigot (both ends of Ex d compartment)	Cylindrical	15	0.08
30 mm diameter window fitted against enclosure	Flanged	10.7	0.02
39.5 mm diameter window fitted against enclosure	Flanged	10	0.02

Gaps shall not be machined to be any larger than the values of 'i_C', and widths shall not be modified to be any smaller than the values of 'L', shown in the table above.

15.2 Connections to the I.S. port on the side of the detector enclosure shall be made via equipment which maintains the intrinsically safe levels of protection.

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England

Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

15.3 Where Um marked on the associated apparatus is less than 250V it shall be installed in accordance with one of the following:

- Where Um does not exceed 50Vac or 120Vdc, in a SELV or PELV system or,
- Via a safety isolating transformer complying with the requirements of IEC 61588-2-6 or technically equivalent standard, or
- Directly connected to apparatus complying with IEC 60950, IEC 61010-1, or technically equivalent standard, or
- Fed directly from cells or batteries

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17 **CONDITIONS OF CERTIFICATION**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

17.3 Each unit shall be subjected to a dielectric strength test in accordance with EN 60079-7:2007 clause 6.1 for at least 1 second. Alternatively, 1.2 x the test voltage may be applied and maintained for at least 100 ms.

17.4 The window section of each enclosure shall be subjected to a routine overpressure test at 31 bar for at least 10 s as required by clause 16.1 of EN 60079-1:2007. There shall be no damage to the window.

17.5 The manufacturer shall provide the user/installer with an appropriate copy of the certificate for each component approved device that is fitted in the equipment.

17.6 The end user shall not have the option to change the settings of the software such that there will be an increase in power dissipation/current consumption beyond that of the models listed on the certificate.

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England

Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com

Certificate Annexe

Certificate Number: **Sira 13ATEX1182X**

Equipment: **Open Path Gas Detector SafEye Quasar 900**

Applicant: **Spectrex Limited**

Issue 0

Drawing	Sheets	Rev	Date (Sira stamp)	Title
888178	1 of 1	B	18 Apr 13	Source Label
888179	1 of 1	B	18 Apr 13	Detector Label

Sira Certification Service
Rake Lane, Eccleston, Chester, CH4 9JN, England

Tel: +44 (0) 1244 670900
Fax: +44 (0) 1244 681330
Email: info@siracertification.com
Web: www.siracertification.com